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New Government-University Relationships in Research

By CHARLES V. KIDD

Technical Cooperation in Education Through ICA

By RALPH W. RUFFNER

U.S. DEPARTMENT OF
HEALTH, EDUCATION, AND WELFARE
Office of Education

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New Government-University Relationships in Research

By CHARLES V. KIDD.*

UNTIL the last quarter of the 19th century, the Federal Government was more active in stimulating basic and applied science than were the Nation's universities. In fact, Government support of research outside the universities has long been taken for granted. Despite this long tradition, it was not until World War II that the Federal Government emerged as a major source of funds for and a potent influence on the research of universities.

The new Federal role in research arises from a scale of support so vast as to bring qualitative as well as quantitative changes, from the variety of fields supported, the vitally important new mechanisms for support, and the number of Federal agencies involved. It arises also from a wide variety of indirect effects on teaching and learning, and on the financing and administration of universities. The implications of this new force for our system of higher education cannot be presented fully in an article such as this. But the nature and magnitude of the forces at work can be sketched, some of the major effects noted, and some questions for the future posed.

The origins of the large-scale involvement of the Federal Government in university research are to be found in World War II, the cold war, and the existence of an accelerating scientific revolution that can leave no aspect of our culture untouched. Both universities and Government have become inevitably involved in this revolution, and in doing so they have become involved with each other. (In this article, "university" is synonomous with "institutions of higher education," since about 95 percent of all Federal research funds to institutions of higher education go to universities.)

The Government must utilize science, including science in universities, to an unprecedented degree as the indispensable key to national survival and material welfare. Science must be not only used but fostered by Government, and this entails, among other things, Government assistance to universities. At the same time, universities are the free institutions through which the right of man to know and to seek knowledge is safeguarded. They must resist pressures, including any which may be exerted by Government, tending to restrict their freedom.

Several basic questions arise from these differences in Government and university functions and goals:

> *Can the Government get what it needs from universities without distorting and controlling them?*
>
> *Can universities accept the research funds which they need without becoming extensions of the Federal apparatus?*
>
> *What have been the answers to these critical questions to date, and what are the prospects for the future?*

These are, of course, large questions. What is attempted in the following paragraphs is a summary

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sampling of a few facets of this interesting relationship.

Federal Aid and Freedom

During the year ending June 30, 1960, the Federal Government will spend somewhat more than $750 million to finance university research—roughly $450 million in universities and $300 million in research centers associated with universities. This is about 15 percent of the operating income of all universities, and a much larger proportion of the income of a few of them. No institution can remain unchanged in the face of such a volume of funds from outside sources, particularly when much of the money is earmarked for narrowly defined purposes and when some of the support may be withdrawn with little advance warning.

While 70 percent of all research conducted by universities is federally financed, the proportion varies widely by field. In 1953–54 it ranged from 95 percent in physics and mathematics to 25 percent in the social sciences (table 1). Since 1953–54 the Federal proportion has increased in most fields.

Has virtually complete Federal financing of research in physics and mathematics decreased the freedom and productivity of university research in these fields? Conversely, has the high proportion of research financed through nonfederal funds placed research in such fields as the life sciences and the social sciences in a position of relatively greater freedom and productivity? In my opinion, it would be most difficult to demonstrate any relationship between the freedom and productivity of research in any field of science and the extent of Federal support of that field.

Federal funds have in a fundamental sense expanded the freedom of investigators in virtually all fields. They are free to do things that they could not think of doing without Federal aid.

One often hears the complaint that the heavy concentration of Federal funds in engineering, the physical sciences, and the life sciences tends to distort university research. If this is so, one would expect universities to use their own money to redress the balance. But since the universities use 78 percent of their own research funds for research in engineering, the physical sciences, and the life sciences and only 22 percent for the social sciences (17 percent, social sciences; 3 percent, psychology; and 2 percent, all others including the humanities) (table 2), one may well question whether those who control the distribution of university research funds are deeply concerned about balance.

Table 1.—Percent of university research financed from Federal funds, 1953–54

Field	Percent
All fields	69
Life sciences	50
Physical sciences	86
Chemistry	70
Physics	96
Mathematics	94
Others	80
Engineering	82
Psychology	76
Social sciences	25
All other	50

Source: National Science Foundation. *Scientific Activities for Research and Development in Colleges and Universities—Expenditures and Manpower, 1953–1954.* Washington: U.S. Government Printing Office, 1959.

Table 2.—Distribution of Federal, university, and foundation research funds by field, 1953–54

Field	Total	Federal	University	Foundation
All fields	100	100	100	100
Engineering and physical sciences	58	70	35	8
Life sciences	32	24	43	70
Social sciences, psychology, arts, and humanities	10	6	22	22

Source: National Science Foundation. *Scientific Activities for Research and Development in Colleges and Universities—Expenditures and Manpower, 1953–1954.* Washington, U.S. Government Printing Office, 1959.

What the Federal Government wants

The Federal Government, in effect, buys research to secure answers the various Departments need. The Department of Defense, for example, is a large-scale purchaser of research from universities—about $135 million worth in 1960. But the Government is also—and to an increasing degree—a patron of research. In this capacity, Federal agencies support

research in universities not to secure findings of immediate interest to the agencies but to sustain an activity of vital importance to the Nation.

While some research is purchased by contract and some is supported by grants, the legal form is less significant to universities than the terms and conditions under which funds are made available. The terms of some research contracts, such as those written by the Office of Naval Research, provide as great a degree of freedom as do liberal research grants from private foundations. Many Federal research grants are less restrictive than many grants from private foundations.

Federal agencies are gradually shifting emphasis from purchase to support of research. For example, in 1952 Department of Defense funds for purchase of research were 73 percent of the total amount Federal agencies spent for university research; in 1960 they are only 30 percent. Three important implications of this trend are worth noting. First, the Federal Government will deal increasingly with universities on the basis of their long-term capacity as intellectual centers and less as research organizations from which they can buy information. This will bring to the fore such things as the ways in which the funds affect the teaching of graduate students, the careers of teachers, and the financial stability of universities. Second, Federal support of universities would in all likelihood be sustained on a broad scale even if all possibility of conflict between the United States and the USSR were to disappear. The third implication of this shift towards aid to research not aimed at defense requirements is that universities might be well advised to abandon, as many in fact already have abandoned, the unproductive cliché that Federal research money is "soft" money and to be avoided. The more productive approach is that of the universities which work assiduously to secure Federal funds under the conditions meeting their fundamental needs for freedom and stability.

What the universities want

One of the most striking and valuable characteristics of our system of higher education is diversity. University standards, objectives, and methods vary so widely that one cannot characterize the whole. Yet some fundamentals seem applicable to the whole system. Our universities, evolving from the European tradition, are, ideally, communities of scholars devoted to the preservation, transmission, and discovery of knowledge. In addition to these three basic functions, however, American universities have, in contrast to European universities, a strong indigenous tradition of service to the community. The involvement of universities with Federal research springs largely from this tradition. This probably explains why the British, for example, are alarmed when as much as 16 percent of their separately budgeted university research is financed by Government, while the financing of 70 percent of university research by our Federal Government has not particularly alarmed educators in this country.

The theme of freedom as a central reason for the existence of universities is universal and of overriding importance. Most of the actual and potential effects of Federal research funds on universities can be weighed in the light of their effects on the freedom of the universities.

In some ways, the freedom of scientists has at times been restricted through Federal research funds. Such things as narrowly defined projects, excessive reporting requirements, and unstable support have tended to reduce the freedom of investigators. But these are not general characteristics of the system, and the ways in which the freedom of investigators may have been reduced seem much less significant than the ways in which freedom has been extended.

The fact that Federal funds are for research, while the universities must also fulfill other functions such as teaching, gives rise to such restrictive effects as the universities have felt. The Federal money tends to emphasize the research function and consequently makes it more difficult for the universities to sustain a balance between teaching and research. By no means all of the effects of Federal research aid upon teaching are unfortunate. Graduate students in fields heavily supported by Federal research funds are probably being better educated than ever before in our history. The Federal funds have enabled universities to expand their teaching staffs.

But the picture is not all bright. Many of the better graduate students become research assistants because the pay and other rewards are greater than those available to teaching assistants. Emphasis upon graduate teaching sometimes tends to reduce the care with which undergraduates are taught. Encroachment of research upon space for under-

graduate teaching causes problems. The general status of and financial rewards for research tend to make concentration upon undergraduate teaching relatively less attractive. In short, a good case can be made for the claim that undergraduate teaching is the university activity adversely affected by the availability of Federal research money.

Some of the less productive consequences of Federal funds for university research result not so much from restriction of freedom by Federal agencies as from the unwillingness or inability of institutions or individuals to exercise the degree and kind of responsibility, restraint, and judgment required by a large and sudden extension of freedom. To be specific:

♦ Federal funds do not force universities to establish large associated research organizations; the funds make the organizations possible if the universities want to have a large research enterprise.

♦ Federal funds do not force heavy emphasis upon applied research to the detriment of basic research; many departments and individuals are happy with applied research and testing and developmental work.

♦ Decisions to permit Federal research funds to be used to supplement faculty salaries in ways that generate interdepartmental difficulties are not made by Federal agencies.

Yet, the Federal funds do exert pressures. The universities are not in fact free to refuse all Federal funds. The money does exert general massive pressures that are difficult to resist.

In short, both Government and universities share responsibility for the strains that have inevitably arisen as they worked out a new relationship in a field where the goals of Government and of universities are not entirely compatible.

Structure and Operation of Universities

One of the most significant effects of Federal research funds has been to remove from universities the authority to make some decisions they formerly made. Which faculty members are to receive aid for their research and what amounts are they to receive? Such questions are now decided generally by scientific groups meeting in Washington, not by persons or groups within the institution. The scientific groups are composed, for the most part, of faculty members chosen for their competence in a discipline or field of research. The Federal research program has placed decisions in the hands of the scientific community, assembled not as faculty groups in individual schools, but as scientific advisory groups to Federal agencies.

The judgments on scientific matters arrived at by these advisory groups are probably as good as or better than those which would be made within the individual universities. But this method has created serious problems for the universities; the scientific advisory groups do not consider some of the questions that are important to universities:

♦ What are the teaching responsibilities of the person who is seeking research support or who is being urged to do a job by a Federal agency? The Federal agencies purchasing research typically do not care whether acceptance of a grant or contract will dilute the effectiveness of a teacher. The shift toward support of research tends to bring greater concern for the teaching function.

♦ What is the total space available to the university, and to what extent is the total research program encroaching on teaching space? Authority to control space is often a more effective way of determining a university research policy than is authority over policy in the abstract.

♦ What is the effect of Federal research funds on balance among university departments?

♦ What income, if any, should faculty members with tenure derive from Federal research grants? Some universities have found themselves in difficulty by paying little or no attention to the extent and manner in which faculty members increase their pay by supplemental income from research grants.

Because scientific advisory groups do not and cannot take into account the full consequences of their decisions, universities are forced to establish means of retaining or regaining a degree of control over the acceptance of research funds by faculty. In short, universities must administer their research programs. This accounts for the establishment of new posts, such as vice-presidents for research, and of new organizations, such as university-wide research committees. Ideally, these are a produc-

(*Continued on p. 18*)

Technical Cooperation in Education

Through the International Cooperation Administration

By RALPH W. RUFFNER*

THE International Cooperation Administration established within its Washington headquarters the Office of Educational Services, effective July 1, 1959. Before then there was an education division under the Office of Public Services in ICA's Washington office. By the July action, ICA thus raised the status of education from a division to an office.

I assume that American educators are interested in the Office of Educational Services (generally referred to as O/ED), since it is the one part of the ICA organization in Washington specifically designated education. O/ED and the overseas program which it backstops represent a significant segment of total U.S. Government activity in international education—a segment that carries some measure of the philosophy, content, and reputation of American education to more than forty foreign countries. And the successes and failures of this ICA program in education have direct and continuing connections with American education as a whole.

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Organization

The organization of the Office of Educational Services can best be understood in terms of how it fits into the total picture of U.S. governmental activities in international education, the foreign aid program of the United States as included under the Mutual Security Program, and the technical cooperation program of the International Cooperation Administration.

U.S. Government and international education

Government Programs in International Education, the 42d report by the Committee on Government Operations (1959), summarizes international education activities carried on by more than 20 agencies of the U.S. Government. The summary section of this report includes the following statement (p. 3):

> The principal, current international educational programs of the United States Government which affect higher education and contribute to international understanding are the educational exchange program of the Department of State, the technical cooperation program of the International Cooperation Administration, and the overseas information program of the United States Information Agency.

The summary section also includes the following general observations (pp. 5–6):

> (1) It may seem a needless belabouring of the obvious to say that the United States Government is engaged in a wide variety of international educational activities. Each of the departments and most of the independent agencies of the Government are carrying out activities in this field.
>
> (2) Many of the international educational programs of the United States Government agencies are aspects of other

programs, or are subsidiary to other programs of these agencies.

(3) Although some informal and irregular interagency relationships exist, no single executive or legislative agency, office or committee has an overall responsibility for the coordination of these programs.

(4) It seems clear that there is not only the lack of overall policy and the lack of an overall coordinating agency but there has been even a lack of comprehensive, organized information on what all the agencies of the Government have been doing in this field.

(5) Impact studies in the various countries could help to determine the effectiveness of the programs in their relationships to both higher education and international understanding.

(6) An accurate calculation of total expenditures by the United States Government for international educational activities cannot be made from data presently available.

Thus the International Cooperation Administration, through its technical cooperation program, is but one of many governmental agencies engaged in international education—although it has one of the "principal, current" programs.

The Mutual Security Program

The Mutual Security Program is the joint responsibility of the Department of State, the Department of Defense, and the International Cooperation Administration. A pamphlet put out by these agencies contains the following introductory statement:

> The Mutual Security Program with its technical, economic, and military assistance components is the response of a dynamic nation to challenge directed against the continued survival and progress not only of the United States and other countries of the free world as independent nations, but also of democracy as a way of life, with its fundamental concept of the importance of the individual human being.—*Background for Mutual Security, Fiscal Year 1960*, p. 1.

The same pamphlet covers the elements of the Mutual Security Program for fiscal year 1960, together with the appropriation for each element, as follows in substance:

> 1. *Military assistance*, $1.3 billion (40 percent of total): To support the collective defense system of the free world through arrangements between the United States and 42 other nations.
>
> 2. *Defense support*, $695 million (21 percent): To provide economic assistance, through continuing contributions, for the common defense to 12 strategically located nations which, with the exception of Spain, are in the general periphery of the Sino-Soviet bloc.
>
> 3. *Development loan fund*, $550 million (17 percent): To finance loans for sound projects for economic development in less developed nations of the free world. These loans are made at lower interest rates and with less restriction than those of conventional financial institutions; but in every case there is an obligation to repay.
>
> 4. *Special assistance*, $245 million (8 percent): To provide economic assistance to certain countries which do not support significant forces under military assistance agreements with us, but in which the United States has a special interest, and to support worldwide programs like malaria eradication.
>
> 5. *Technical cooperation*, $181 million (6 percent): To support bilateral and UN programs through which the United States shares with less developed countries its knowledge, skills, and demonstration equipment in the fields of education, health, sanitation, engineering, transportation, communications, agriculture, industry, and administration.
>
> 6. *Contingency fund*, $155 million (5 percent): To provide the Mutual Security Program with enough flexibility to enable it to act quickly in different and unexpected situations; to extend, when necessary, prompt and adequate aid without seriously disrupting other programs; and to prevent political or economic upheavals from reaching more serious dimensions.
>
> 7. *Other programs*, $100 million (3 percent): To finance other programs such as refugee relief, the UN Children's Fund (UNICEF), Atoms-for-Peace, and ocean freight or relief shipments abroad by American voluntary agencies.

The program backstopped by the Office of Educational Services is contained primarily within the technical cooperation element of the total Mutual Security Program.

ICA technical cooperation program

The report *Government Programs in International Education*, in dealing with the Mutual Security Program as a total activity, includes the following statement (p. 67):

> Activities in the field of international education are woven into this total complex of activity in such a way that it is difficult to dissociate them and identify educational activity as a separate entity.

Of course I agree with this statement in its broad sense; yet, because my main topic here is that part of the technical cooperation program of ICA known as the Office of Educational Services, I am attempting to "identify educational activity as a separate entity."

The purpose of the ICA technical cooperation program is stated in section 301 of the Mutual Security Act, as follows:

> It is the policy of the United States and the purpose of this title to aid the efforts of the peoples of economically underdeveloped areas to develop their resources and improve their working and living conditions by encouraging the exchange of technical knowledge and skills and the flow of investment

capital to countries which provide conditions under which such technical assistance and capital can effectively and constructively contribute to raising standards of living, creating new sources of wealth, increasing productivity, and expanding purchasing power.

Section 302 of the same act specifically lists education as an activity within the technical cooperation program.

In addition to education, and with respect to what might be called "technical," "substantive," or "subject matter fields," the technical cooperation program includes the following major areas: Food and agriculture; industry and mining; health and sanitation; transportation; labor; and public services, including community development, public administration, and housing. The table below indicates to some extent the scope of technical cooperation in various areas in fiscal year 1959.

The Office of Educational Services works only in the area of education. The Office is composed of the following major units:

a. Office of the Director.

b. Four program divisions, primarily responsible for program operation in the field: Far East, Near East and South Asia, Africa and Europe, and Latin America.

c. A technical resources division, with specialists in educational administration, vocational education, teacher education, educational materials, elementary education, secondary education, and higher education.

d. A training division, which is concerned with the training of participants in education.

Program of the Office of Educational Services

The ICA technical cooperation program, including the part conducted by the Office of Educational Services, is developed and administered in accordance with the following general statements about the total Mutual Security Program:

> The United States mutual security program in each cooperating country is developed as a balanced and integrated series of activities designed to serve the broad purposes of the basic legislation in terms of United States interests and the overall situation in the particular country.
>
> The basic method of administration of all elements of the mutual security program, as required by the authorizing legislation, involves the following broad steps:
>
> (1) The cooperating country and the United States sign a basic bilateral agreement, under which the United States undertakes to provide assistance for the purposes set forth in the legislation, and the cooperating country assumes certain responsibilities with regard to sharing the cost of activities, making effective use of the assistance given, and other relevant matters.
>
> (2) Under this agreement, the cooperating country requests specific assistance on specific activities or for specific purposes.

Technical cooperation in major areas, July 1, 1958 through June 30, 1959

Field of activity	Total obligation (in millions)	Number of U.S. technicians abroad	Number of foreign trainees [1]	Foreign currency withdrawals [2] (in millions)	Number of university contracts as of June 30, 1959
Food and agriculture	$28.9	856	1,811	$204	21
Education	20.3	362	937	42	22
Industry and mining	13.0	379	1,842	251	11
Public administration	11.2	283	853	14	17
Health and sanitation	10.3	337	701	36	9
Community development and housing	2.5	74	310	44	
Transportation	8.4	269	538	202	
Labor	2.4	42	760	0.98	1
General and miscellaneous	29.8	619	393	182	9
Technical support	18.1				

[1] Arriving in the United States and "third countries" during fiscal year 1959.

[2] From counterpart funds, U.S.-owned foreign currencies under section 550, 402, and Public Law 480, Title I.

SOURCE: International Cooperation Administration, *Operations Report*, 1959.

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(3) ICA reviews such requests and agrees to provide the approved assistance within certain agreed financial and other limitations.

(4) ICA proceeds to provide the requested assistance, either by making financial resources available to the cooperating country with which to acquire the specific goods or services involved for itself, or by providing the goods or services in kind.

Within this broad pattern, the specific methods of administration vary from country to country and within the various types of assistance involved.—*Government Programs in International Education*, p. 67.

At the close of fiscal year 1959 in the field program served by O/ED nearly 200 separate technical cooperation projects were being carried out in more than 40 foreign countries. In the fullest sense, a technical cooperation project includes three major elements: U.S. technicians in the host foreign country, foreign country nationals as "participants" for training, and limited amounts of material—books, equipment, etc.—for demonstration purposes. In the education projects the number of technicians ranges from 1 to 20 or more; the participants from 1 to 150 (the number in a certain project with India); and the material from a few books to many large pieces of engineering education laboratory equipment. The projects cover the whole field of education—for example, there are projects in elementary, secondary, higher, and adult education, and in curriculum development, teacher education, rural education, community education, instructional materials, English language teaching, science education, vocational education, industrial arts, engineering education, home economics, educational administration, audio-visual education, technical education, educational development and research.

Program rationale

The rationale of ICA assistance to education should answer the fundamental question, "What is the role of education in national development?" Such a rationale is complex and not easily derived, for it must clearly identify, reconcile, and blend the philosophies, policies, principles, and procedures of ICA, the host country, and professional education. Philosophies, policies, principles, and operating procedures from each of these factors must be clearly identified, at times objectively reconciled, and ultimately skillfully blended.

In this section I want to summarize the basic guidelines for ICA assistance to educational development. These guidelines may be considered as at least a major element of my personal rationale for education in the ICA program. Such a rationale can serve as a basic framework in planning, developing, implementing, and evaluating the educational programs and projects, under ICA auspices.

1. Effective assistance to the expansion and improvement of education for national development is basic to the attainment of ICA technical cooperation objectives.

National development must be projected as a totality, though in some phases of planning it can be subdivided into such interrelated aspects as economic, political, and social development. The resources available to a country for national development are both human and material, and, as we would agree, the human is more important than the material.

A nation develops its human resources basically through effective education, which leads to changes in the knowledge, skills, and attitudes of its citizens. It develops economically as its people acquire the knowledge and skills they need to use its material resources effectively. It develops politically as its people understand the meaning of individual freedom with social responsibility and accept individual freedom as a way of life. It develops socially as individuals and groups learn to revise their social structures or to create new ones functionally designed to serve the needs of all the people. Since educated citizens are necessary to every phase of development, it is apparent that no country can progress far in economic, political, and social development without the concurrent development of its education system. The nature and scope of its educational system will shape in large measure the form of its economic, political, and social development.

2. ICA/TC assistance in education should be based on thorough educational research and planning—as an integral part of national planning and study of manpower needs—so that functional educational programs may be devised out of which specific projects may be developed.

Progress in national development arises out of effective planning which, in turn, must be based on thorough research. Planning for educational development should be an integral part of national planning and should be based on research to identify educational needs and problems in relation to the progress of the nation. More specifically, educational development must be directly related to manpower needs for the economic, political, and social

development of a nation. Only as educational development is made an integral part of national planning and is directly related to manpower needs will an educational system be able to play its functional role in the development of the nation. The education staff for ICA field mission may find that national and educational planning has already been done by a given host country. In countries where such planning has not been done, the staff may find that assistance in educational research and planning is top priority. In any event, the field education program should be directly related to the educational needs and problems of the host country, and specific education projects are meaningful only within the context of overall educational planning.

3. *ICA/TC assistance in education should export from American education what is applicable to the status, needs, and problems of education in individual countries concerned and is in keeping with ICA objectives.*

The educational system of a country directly reflects national cultures, for to education is assigned the dual task of preserving and improving the culture of a people. Consequently, education in a given country must be particularly and uniquely suited to the needs, hopes, dreams, and plans of the people. It follows, then, that American education cannot be transplanted in total within any given foreign country. Furthermore, what is "exported" from American education through ICA must be compatible with the objectives of the ICA technical cooperation program as a whole. Considering these two program essentials, I think we should give much thought to what is exportable in American education. However, from my experience and without additional study, I would say that the philosophy, organization, administration, and methodology of American education are more exportable than the content of our education programs and courses. And, finally, since we "export people"—our technicians—we should studiously set up criteria for selecting American educators to carry out our education programs.

4. *ICA must obtain and maintain cooperation and assistance from American educational leaders and institutions for support of and participation in ICA/TC programs in education.*

ICA/TC programs in education carry the reputation of American education abroad in cooperating with the educational systems of more than 40 countries—usually at the national level. Consequently, ICA needs the very best ideas, practices, and people in American education for its programs. ICA has had and does have substantial assistance from American higher education through the "university contract" arrangement. As of September 30, 1959, there were 90 ICA-financed university contracts in operation, involving 53 American educational institutions and supporting programs in 33 foreign countries. Continuing progress has been made and is being made in improving the university contract procedure—improvement which requires, fundamentally, that both ICA and the individual university cooperate more effectively in adapting to each other's mode of operation.

Substantial as is the contribution of university contracts, ICA requires more assistance from American education. For example, we need more direct and specific assistance in: (*a*) Recruiting education technicians, especially chief education advisers for field missions; (*b*) "professional undergirding" of programs, perhaps through a new kind of university relationship which might be called a "service contract" (to include research and development) for O/ED itself, a region, or an individual field education program; (*c*) providing inservice training for education technicians; (*d*) preparing university contract technicians; (*e*) training education participants in the United States; and (*f*) using the resources of American public school systems more extensively, perhaps through contract arrangements with State education departments.

5. *ICA/TC assistance in education should recognize that educational programs should be developed concurrently and articulated at all educational levels—elementary through adult education—in order to minimize imbalance in educational development.*

Education, defined in the broadest sense, is continuous from birth to death. The division of formal education into the traditional levels of elementary, secondary, and higher education can be called logical from both administrative and psychological standpoints. In recent years, at least in American education, adult education has been added as the fourth educational level. Despite these divisions, and because of the continuous nature of learning and the educative process, each level of education influences and is influenced by every other level. The educa-

tional system of a nation must be developed at all educational levels—otherwise, dangerous imbalances may be created. In taking cognizance of this general principle, it does not necessarily follow that the education program of each field or mission must include at least one project at each of the four educational levels. However, it does follow that assistance provided by a mission's education program within the context of the host country's own efforts for educational development should not foster imbalance within the national system of education.

6. *ICA/TC assistance in education should focus on training leaders—teachers, specialists, and administrators.*

The key to the effectiveness of any educational system is the competence of its leaders. Generally speaking, education development calls for both expansion and improvement of the existing educational system. Expansion requires additional numbers of educational leaders—teachers, administrators, specialists—in government educational agencies and in individual institutions. Improvement of the existing educational system requires attention, at the preservice and the inservice levels, to training educational leaders. The education program should focus on providing assistance to leadership training, primarily because of the importance of the leader in education; the high development of educational leadership training in American education—an "exportable" competency; and the need to derive the greatest good from the funds provided.

7. *Organization and administration in field missions should provide for the effective planning, development, implementation, and evaluation of the education program.*

Theory, policy, principles, planning, concepts, and guidelines are obviously translated into action through organization and administration by a field agency. I believe that organizational and administrative patterns in education require continuing analysis and study to increase the effectiveness of educational activities of ICA missions. The following items, for example, may be worth such analysis and study:

♦ An educator should be included on any U.S. group assigned responsibility for establishing a field mission.

♦ The position of chief education adviser should be established and filled before a mission initiates ICA assistance in education.

♦ Chief education advisers should be carefully selected on the basis of professional and administrative qualifications.

♦ The chief education adviser should devote continuing personal attention to increasing the effectiveness of the organization and administration of the mission education.

♦ Relationships between the education division and other parts of the mission organization—especially the program and training components—need to be more clearly defined.

♦ The service role of the education division to other functional divisions of the mission—agriculture, health, and others—needs to be more fully developed.

♦ Relationships between university contract field teams and the mission need to be more clearly defined.

♦ Effective procedures should be established for using regional approaches in educational activities.

♦ Effective mechanisms should be established for the coordination of field activities in education with the educational activities of other U.S. and other foreign agencies.

Summary

This article is concerned with the "Office of Educational Services," that part of the Washington headquarters of the International Cooperation Administration which specifically is designated "Education." O/ED is concerned primarily with backstopping a significant part of the ICA Technical Cooperation Program, which in turn, is one element in the total Mutual Security Program of the United States Government. My personal rationale for the educational activities of O/ED is based upon seven "guidelines" which, in summary, state that ICA/TC assistance in education: (1) is basic to the attainment of ICA/TC objectives; (2) should be based upon thorough educational research and planning; (3) should use effectively what is "exportable" from American education; (4) must be supported by American education; (5) should not foster educational imbalance in the host foreign country; (6) should focus on training of leaders; and (7) should be effectively provided for in USOM organization and administration.

Education, an Instrument of International Policy

By OLIVER J. CALDWELL*

A QUIET REVOLUTION seems under way in our relations with underdeveloped countries. American higher education is already a partner of Government in carrying out international policy; it may soon be asked to accept unprecedented new responsibilities for which it is poorly prepared.

Some clues as to what these responsibilities will be can be found in the events now taking place in the emerging countries of Africa and Asia—events that may finally determine the future of all mankind. Soon about one-third of the members of the United Nations will be new African countries. Their votes, and the votes of new nations of Asia, may have a decisive effect on history.

Our welfare is closely linked with the welfare of these emerging peoples. We need their raw materials, as they need our manufactured goods. They need our technical assistance, and we could be severely damaged by their hostility.

A symbiotic relationship is developing between Americans and these people of Africa and Asia which is new in human relations. The relationship is a welcome one, but it is endangered by the eagerness of the Soviet Union to supplant the United States in it.

The new nations share certain characteristics. Most of their people are hungry and illiterate. Most of their material resources are undeveloped. They have rich cultural traditions. They are in a hurry to achieve material parity with the West, and look to us for help. They are proud of their freedom and hate colonialism.

Sympathetic with their ambitions and points of view, and always aware that our own welfare is bound with theirs, we have given these nations various kinds of help in what we call our "foreign-aid" program.

- We have helped many of them to build up their armed forces.
- We have given or loaned money for investment in factories, dams, mines, and other sources of wealth.
- We have given, or sold on credit, our agricultural surplus to relieve emergencies.
- We have given technical assistance in health, agriculture, education, mining, forestry, management, police affairs, business administration, and so on.

A very small proportion of the funds available for this help has gone into education, but this proportion is growing. Our goal is the permanent improvement of local standards of living.

There is no acknowledged strategy for peace. We have had to make our own rules as we proceed. In general, our foreign-aid programs have had considerable success, but we are finding that they must give a larger place to education than we originally expected. Experience indicates, for example, that if we feed the hungry our surplus grain, they are hungry again when the grain is gone. If we build dams and factories in areas where the people are illiterate, trained outsiders must be imported to operate them and the net result is a new colonialism. The only satisfactory solution is to give the people the knowledge and the skills they need to grow their own food and operate their own factories.

Thus, education comes first: it is the *cause* of economic advancement, not just a luxury which only the wealthy can afford. Skill, knowledge, and wisdom are indispensable to progress—and to self-government.

There are many indications that we are beginning to use education as a principal instrument for the achievement of our international objectives. The Department of State, for example, recently appointed Robert H. Thayer, who has repeatedly emphasized

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the new strong role of education in international relations, to be special assistant to the Secretary for the Coordination of International Educational and Cultural Relations. And the International Cooperation Administration is asking Congress for authorization and funds for a new development program in Africa—a program that will be exclusively for education and training.

Our recognition of the power of education in international affairs is in itself a tremendous step toward international sanity. When we give away knowledge, we are never impoverished; international cooperation in education is bound to enrich our national life.

But we also face some serious problems. Our attempts to use these new opportunities for educational service may severely strain our own educational structure. They will require substantial support from our institutions of higher education. At the very time when we are shorter than ever of educational staff and facilities, we will be asked to share increasingly with our friends around the world.

We also have much to learn about the tactics of using education for material and social advancement. There is growing agreement in the truth of this equation:

People + learning + natural resources = a reasonable chance to achieve a good life.

But there is no agreement on what kind of learning is needed, or how much, or for whom. There are arguments about whether it should start from the bottom or from the top. There is serious need for fundamental research to test results and develop techniques for the proper use of education as an instrument of international policy.

The American university, as such, is rapidly becoming a world university. In the years immediately ahead, there will be an unprecedented opportunity for American education to serve America by serving mankind.

National Defense Education Act Notes

Additional Language and Area Centers

SEVEN additional colleges and universities will receive Federal support for the operation of nine language and area centers during the 1960–61 academic year. This brings the total number of centers to be supported next year to 40, of which 19 will be supported for the second year and 21 for the first time. The centers are authorized under title VI of the act.

Languages to be supported at the nine centers are spoken in Central and Eastern Europe, Africa, the Near East, and South and Southeast Asia. The 31 centers previously announced are receiving Federal support in languages spoken in all major geographical areas of the world.

Colleges and universities conducting centers contribute at least the equivalent of Federal funds granted. Total Federal and institutional funds for the 40 centers thus far announced will be about $2.9 million.

Commissioner Derthick has designated 6 languages as requiring highest priority in programs and another 18 languages as requiring second priority, to meet the needs of education, industry, business, and government. All of these languages are being supported at the 40 centers.

Regular-Session Language Institutes

FOUR regular-session modern foreign language institutes will be conducted during the 1960–61 academic year for 100 elementary and secondary school teachers of French, German, Russian, and Spanish. In addition, a Russian language institute at Dartmouth College will be conducted next summer.

Public school teachers will, upon application, receive stipends of $75 a week and $15 a week for each dependent. Private school teachers attend the institute without charge but receive no stipends. The 4 regular-session institutes will cost about $500,000. The thirty-six 1960 summer institutes will cost about $2.6 million and will be attended by over 2,000 teachers.

Last summer 12 summer institutes were conducted. Four regular-session institutes are now in operation, of which two—Indiana University and the University of New Mexico—will be conducted again in 1960–61. The other two will be at Kent State University (Ohio) and Pennsylvania State University. Language teachers interested in attending an institute should apply directly to the college or university.

1960–61 Counseling and Guidance Institutes

ABOUT 800 secondary school teachers will receive training at 22 counseling and guidance regular-session institutes to be conducted by colleges and universities throughout the country during the 1960–61 academic year. The 84 summer institutes to be conducted next summer for about 3,000 secondary school counselors have been previously announced.

Most of the teachers who will attend the regular-session institutes will have had some counselor training, and the training offered at the institutes will enable many of them to complete their academic requirements for State certification as counselors. Enrollees at the summer institutes will be people already engaged in counseling in secondary schools.

Six of the 22 regular-session institutes will be conducted during the full academic year and will serve teachers from major geographical regions. Four of these will enroll students for both semesters, and two will enroll one set of students during the first semester and another set during the second. The remaining 16 institutes will be conducted for less than a full academic year, generally for one semester only, and will serve teachers from the States in which they are located and from nearby States.

The colleges and universities to conduct institutes were selected with the help of consultants from counseling and guidance programs at institutions of higher education who reviewed and rated the proposals submitted.

Federal funds for the regular-session institutes will total $2,390,000. Teachers from public secondary schools will receive stipends of $75 a week plus $15 a week for each dependent; those from private schools attend the institutes without charge but receive no stipends.

CORRECTION

The discussion of first-time enrollment of students on a full-time basis which appeared on page 12 of the March issue of *Higher Education* in the preliminary report on the survey of organized occupational curriculums, 1958, contains three errors. The second and third sentences of the second paragraph should read: "Such enrollment figures are up 8.1 percent from 1957, from 55,464 to 59,940 students. The largest increase of first-time full-time students occurred in nonengineering-related curriculums—an increase of 9.5 percent over 1957."

Ninth Regional Representative Named

RALPH J. BECKER, superintendent of schools in Evansville, Ind., has been named by U.S. Commissioner of Education L. G. Derthick as regional representative of the Office of Education in the Kansas City, Mo., regional office. His appointment completes the roster of the nine regional Office of Education representatives. One NDEA (higher education) representative has yet to be named, as is indicated by the single vacant space in the following listing:

Regional office		*Office of Education representative*	*NDEA (higher education) representative*
Region I	Boston	Donald C. DeHart	Eino A. Johnson
Region II	New York	Herman L. Offner	Edward S. Noyes
Region III	Charlottesville	Carl E. Seifert	M. Howard Bryant
Region IV	Atlanta	James M. Smith	
Region V	Chicago	Eric R. Baber	Clarence E. Deakins
Region VI	Kansas City, Mo.	Ralph J. Becker	George W. Rosenlof
Region VII	Dallas	Hollis A. Moore, Sr.	Leonard G. Nystrom
Region VIII	Denver	Lloyd A. Garrison	Carroll V. Galbreath
Region IX	San Francisco	Richard B. Farnsworth	Robert E. McConnell

Other Program Notes

India Farm College Follows U.S. Pattern

INDIA soon will have its first agricultural university. It will be at Rudrapur, in Uttar Pradesh State, near a 16,000-acre state farm. The farm will be attached to the university for use as a laboratory for research and experiment.

The university is expected to cost about 19,000,000 rupees ($3,800,000) and will be run on the model of the land-grant colleges of the United States for developing rural leadership and competence. It will have three colleges—for agriculture, animal husbandry and veterinary sciences, and agricultural engineering and technology. The university will have about 325 students, according to present plans.

Social Science Specialist Named

THE APPOINTMENT of John L. Chase as specialist for the social sciences, Division of Higher Education, has been announced by U.S. Commissioner L. G. Derthick. Dr. Chase received the B.A. and M.A. degrees from Harvard University and the Ph. D. degree in political science from Princeton in 1952. He served with the Office as specialist for fellowships in the Financial Aid Branch from December 1958 to February 1960. His earlier experience includes service as assistant professor of political science at Brown University and as visiting lecturer (and associate professor) in political science at the University of North Carolina, Louisiana State University, and Indiana University.

ROTC Position Stated

THE DEPARTMENT of Defense has come out with the most explicit statement it has issued on required basic ROTC.

In the form of a letter to the heads of major educational organizations, over the signature of Charles C. Finucane, Assistant Secretary of Defense (Manpower and Personnel), the Department says in effect:

(1) The Department of Defense does not favor either compulsory or elective ROTC as opposed to each other, but "freedom of choice" by the institution. The Department will support the decision of the institution by furnishing the necessary instructors and equipment.

(2) No military requirement exists for required basic ROTC.

(3) There are probably many values to the individual and the institution in required ROTC, but these do not constitute a justification for the Department's favoring it as contrasted with elective.

(4) "There is merit" in a Department of Defense policy favoring elective ROTC, but since many fine institutions want compulsory ROTC, the Department feels it should support them by providing instructors and equipment.—AALGC SU circular letter No. 6.

NSF Summer Science Training Opportunities

HIGH SCHOOL science teachers will have an opportunity to improve their skills in two National Science Foundation summer programs, which were announced March 13.

High school teachers who need to learn more about methods of research will benefit from this year's second group of grants in the Research Participation for Teacher Training Program, which will provide for an additional 200 teacher participants at 23 institutions. The first group of grants in this program was announced Jan. 25, 1960, by NSF. Together, the two groups of grants provide a total of 750 participants at 80 institutions at a total cost of about $1,244,000.

High school teachers who have adequate theoretical training but insufficient laboratory experience may benefit from the second group of grants. Six grants totaling $66,730 will enable 62 teachers to get thorough grounding in laboratory techniques and equipment.

Teacher participants in all programs will be chosen by the cooperating institutions, listed below. Inquiries and applications should be addressed to the directors of the programs, NOT to the Foundation. Early inquiry is advised. Participating teachers will receive stipends of up to $75 per week plus allowances for travel and dependents.

Research Participation for Teacher Training

Summer, 1960

CALIFORNIA. University of California, Berkeley; Donald C. Bryant, program coordinator, Engineering Sciences Extension. Biology, chemistry, engineering, geology, mathematics, physics; 7 weeks beginning June 20; 15 high school teachers.

Long Beach State College, Long Beach; Darwin L. Mayfield, Dept. of Physical Science and Mathematics. Chemistry; 8 weeks beginning June 20; 6 high school and college teachers.

College of the Pacific, Stockton; Joel Hedgpeth, Pacific Marine Station, Dillon Beach, Marin County. Biological and hydrographic science; 7 weeks beginning June 20; 8 high school and college teachers.

Stanford University, Stanford; O. Cutler Shepard, Dept. of Metallurgical Engineering. Science of materials; 8 weeks beginning June 20; 6 college teachers.

COLORADO. Colorado State University, Fort Collins; Merle G. Payne, Dept. of Chemistry. Biology, chemistry, engineering, mathematics, physics; 10 weeks beginning June 13; 10 college teachers.

FLORIDA. Florida State University, Tallahassee; Leland Shanor, Dept. of Biological Sciences. Biological and physical sciences, psychology; 8 weeks beginning June 13; 12 college teachers.

ILLINOIS. Knox College, Galesburg; Russell Sutton, Dept. of Chemistry. Chemistry; 9 weeks beginning June 13; 4 high school and college teachers.

INDIANA. Goshen College, Goshen; Henry D. Weaver, Jr., Dept. of Chemistry. Chemistry; 10 weeks beginning June 6; 4 high school teachers.

Indiana University, Bloomington; Paul Klinge, coordinator for school science. Astronomy, biology, chemistry, physics, psychology; 8 weeks beginning June 20; 15 college teachers.

KANSAS. Kansas State Teachers College, Emporia; Ted F. Andrews, Dept. of Biology. Biology, 12 weeks beginning June 6; 6 high school teachers.

KENTUCKY. University of Kentucky, Lexington; Ernest M. Spokes, Dept. of Mining and Metallurgical Engineering. Chemistry, geology, mathematics; 8 weeks beginning June 1; 3 high school teachers.

MISSISSIPPI. University of Mississippi, University; Barton Milligan, Dept. of Chemistry. Chemistry; 10½ weeks beginning June 9; 6 college teachers.

MONTANA. Montana State University, Missoula; Ludvig G. Browman, Dept. of Zoology. Biology; 10 weeks beginning June 13; 2 high school teachers.

NEW MEXICO. University of New Mexico, Albuquerque; Phillip E. Bocquet, Dept. of Chemical Engineering. Biology, chemistry, physics; 11 weeks beginning June 13; 10 high school teachers.

NEW JERSEY. Newark College of Engineering, Newark; James A. Bradley, Dept. of Chemical Engineering. Chemistry and physics; 8 weeks beginning July 1; 8 high school teachers.

NEW YORK. Clarkson College of Technology, Potsdam; F. Gordon Lindsey, director of summer programs. Chemistry and physics; 9 weeks beginning June 27; 10 high school teachers.

Roswell Park Memorial Institute, Buffalo; Edwin A. Mirand, director of summer programs. Biology; 9 weeks beginning July 1; 10 high school teachers.

NORTH CAROLINA. North Carolina State College, Raleigh; Homer C. Folks, School of Agriculture. Biology, chemistry, mathematics, physics; 9 weeks beginning June 6; 15 high school and college teachers.

OHIO. Ohio State University, Columbus; F. E. Deatherage, Dept. of Agricultural Biochemistry. Biology and chemistry; 10 weeks beginning June 18; 4 college teachers.

OKLAHOMA. University of Oklahoma, Norman; Horace H. Bliss, 61 Faculty Exchange. Biological and physical sciences, mathematics, engineering; 8 weeks beginning June 6; 10 high school and college teachers.

PENNSYLVANIA. Temple University, Philadelphia; David Sarner, Division of Secondary Education. Biology, chemistry, mathematics, physics; 8 weeks beginning June 21; 10 high school teachers.

SOUTH CAROLINA. Furman University, Greenville; J. A. Southern, Division of Science and Mathematics. Biology, chemistry, physics; 8 weeks beginning June 6; 10 high school teachers.

TEXAS. North Texas State College, Denton; Robert C. Sherman, Department of Biology. Biology, chemistry, physics; 11 weeks beginning June 6; 8 high school and college teachers.

Laboratory Training for Science Teachers, Summer, 1960

COLORADO. Colorado State University, Fort Collins; Walter R. Benson, Department of Chemistry. Chemistry; 8 weeks beginning June 20; 8 high school teachers.

MICHIGAN. Michigan College of Mining and Technology, Houghton; M. E. Violin, Institute of Mineral Research. Chemistry; 8 weeks beginning July 5; 2 high school teachers.

MINNESOTA. St. Mary's College, Winona; H. Charles, F.S.C., Department of Biology. Biology; 4 weeks beginning July 5; 24 high school teachers.

NORTH CAROLINA. Pembroke State College, Pembroke; Henry Tamar, Science Department. Biology and chemistry; 6 weeks beginning June 6; 12 high school teachers.

OHIO. Central State College, Wilberforce; Bernard H. Johnson, Chemistry Department. Biology and chemistry; 8 weeks beginning June 20; 10 high school teachers.

TEXAS. East Texas State College, Commerce; J. H. Clements, Department of Physics. Physics; 6 weeks beginning June 6; 6 high school teachers.

(*Continued from p. 6*)

tive adaptation to potentially divisive and harmful outside pressures.

In practice, universities sometimes find it difficult to establish a general institutional policy after staff members and departments have been accustomed to acting with virtually complete independence. The key to effective determination and execution of general university policy and to dealing effectively with Federal agencies on research matters seems to be strong rapport between the faculty and the administrative staff. In some universities the attainment of this happy state of affairs appears to be more difficult than the establishment of a reasonable modus vivendi with Federal agencies.

Geographical Distribution and Related Policy Questions

Federal research funds are highly concentrated among a few universities. Ten universities received in 1959 about a third of the grant funds of the National Science Foundation and the Public Health Service. In 1953–54, 14 of the 173 universities receiving Federal research funds received 55 percent of the total. Funds of the Department of Defense are most highly concentrated; those of the Department of Agriculture most widely dispersed.

The Department of Agriculture deliberately created a geographically dispersed national research structure which has become the most productive organization of its kind in the world. The general principle was not to seek research talent and support it, but to establish centers for agricultural research which would nurture talent.

For historical and other reasons, such as the exigencies of war and the possibility of solving most nonagricultural research problems without regard to local soil and climatic conditions, most Federal agencies support talent where it exists. Talent is highly concentrated in universities. Research capacity is probably measured as well by production of Ph. D.'s in science as by any other single measure. In 1954–55, five universities granted 24 percent of all Ph. D.'s in science. The distribution of Federal research funds is highly correlated with the production of doctorates and, hence, with research capacity.

Should the development of geographically dispersed centers of research strength be deliberately fostered through Federal contracts and grants? I believe so for a number of reasons. First, research is a generally invigorating force in an area. Second, strong competing intellectual centers are good for the country as a whole. Third, research in some of the large universities has grown so much that some parts of the universities resemble large research institutes more than they do universities. Fourth, the Nation cannot afford to concentrate its best teachers, investigators, and students in a few gigantic research-teaching centers.

If diversification of university research were to become a general Federal policy, extensive changes would be necessary. Most important, strengthening of universities and of science for the long run would have to be accepted as a goal of the Federal Government; this would require grants and contracts to institutions that could not produce over the short run as much per research dollar as the large research centers. Cooperation among Federal agencies on a more extensive scale than has yet occurred would be required. Finally, a policy of dispersion would work well only if the total requirements of universities, in contrast with needs for money to support research, were taken into account.

An important generalization can be drawn from consideration of the question of dispersion. As soon as the Federal Government takes into account considerations beyond the most effective and efficient support or purchase of research in universities, it becomes involved in important matters of general educational policy. These wider considerations include not only the geographical distribution of our national research facilities but also the training of manpower for the future, the construction of physical facilities for research in universities, and the operation of nonuniversity research centers. The entire question of Federal aid to higher education is involved and not simply that of a broader geographical distribution of research funds under the existing system.

The big unanswered question is how the Federal aid is to relate to the educational function of universities. The present state of affairs is not entirely satisfactory. Since the aid is for research, the educational implications cannot be seen clearly or taken directly into account. Moreover, the manner and extent to which the nonresearch functions of uni-

versities are affected is almost entirely fortuitous. On the other hand, the research aid does provide a means for probing and testing the realities of Federal aid to higher education without forcing a direct decision on the broad question.

Conclusion

Questions of the kind asked in this article have not been adequately studied by those in academic life or in Government. The whole area abounds with unknowns. Some of them are factual but significant. For example, how have universities shifted their organizational structures to handle research grants and contracts? What are university policies with respect to payment of the salaries of faculty members in whole or in part from Federal research funds? What is the rationale of the policies? What are their effects? Other questions are more fundamental. How, in fact, do universities determine research policies? At what points in the academic structure are various kinds of decisions actually made? What is the actual content and effect of institutional policy as contrasted with school or departmental policy? What has been the effect of Federal research funds on the quality of teaching in specific fields; what in the administration of Federal funds most significantly determines their effect on the university.

In the further examination of the relationships between the Federal Government and universities there is a rich and relatively untouched area for academic work. The questions are political in that they relate to the effects upon society of a new role of the State. The questions are social in that they have to do with the way people act in a new situation. The questions are administrative in that they are concerned with the adaptation of institutions to a new external force of great magnitude and significance.

The most thorough studies of various interrelationships of Government and science have been produced by persons with governmental background. This fact is in itself a commentary on the Government's relation to research in universities. Those in academic life have, in a sense, an obligation to study intensively the complex ramifications of the Federal activities related to science and their effect on universities. Universities, Government, and foundations might cooperate in stimulating further work in this area.

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Government Publications

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(*1*) *Cost Publications: Send request, enclosing remittance (check or money order), to the Superintendent of Documents, U.S. Government Printing Office, Washington 25, D.C.*

(*2*) *Free Publications: Request direct from the agency issuing them.*

From the Office of Education

Educational AM and FM Radio, and Educational Television Stations, by State and City, prepared by Gertrude G. Broderick. Washington, Office of Education, 1960. Processed, 18 p. (OE–34001.)

Engineering and Scientific Manpower, by Henry H. Armsby. Washington, U.S. Government Printing Office, 1960. Paper, 68 p. (OE–50003, Circular No. 610.)

Describes current engineering and scientific manpower programs in fields of engineering, science, and teaching, in what are believed to be the most active national agencies working to improve the supply and utilization of persons in these fields. Discusses programs of 15 nongovernmental organizations, 11 Federal agencies, and 4 presidential committees.

Financial Assistance for Strengthening Science, Mathematics, and Modern Foreign Language Instruction. Regulations, Sections 301 through 304 of Title III, National Defense Education Act of 1958. Washington, U.S. Government Printing Office, 1960. Processed, 8 p. (OE–22004.)

International Teacher Development Program 1958–59: Annual Report to the International Educational Exchange Service, U.S. Department of State. Washington, U.S. Government Printing Office, 1959. Paper, 79 p. (OE–14003.)

Summary of programs sponsored by the Office of Education in cooperation with International Exchange Service of the U.S. Department of State. During the 1958 fiscal year educational programs were arranged for 419 visiting educators from 59 countries. Publication reviews regular six-month program, special projects, and activities of the staff of the Office of Education on behalf of the grantees.

Library Services Act (P.L. 84–597): Three Years of Progress. Washington, U.S. Government Printing Office, 1960. Processed, 4 p. (OE–15006.)

Briefly states major provisions of Library Services Act, progress during its first 3 years, and past and present needs for library service in rural areas.

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Other Government Agencies

Area Study Programs in American Universities. Washington, U.S. Government Printing Office, 1959. Paper, 106 p. (Limited number of copies free from the External Research Division *or* the Office of Public Services, U.S. Department of State.)

Describes 96 programs of graduate study of foreign areas, categorized under Africa, Asia, Latin America, Near East, Russia and Eastern Europe, and multi-area. Brings the February 1956 edition up to date. Provides data on the programs listed there and information on 38 programs that are new or that have not been previously listed.

Guidance Implications of the National Defense Education Act (reprinted from the *Occupational Outlook Quarterly*). Washington, Bureau of Labor Statistics, U.S. Department of Labor, 1959. Processed, 7 p.

Manpower, Challenge of the 1960's. Washington, U.S. Government Printing Office, 1960. Paper. 24 p. (U.S. Department of Labor pamphlet.)

Shows the changes in U.S. population and labor force which are expected to take place between 1960 and 1970 and the implications of these changes for the education and training of youth and for the management and utilization of overall labor supply. Includes data on increasing school enrollments, amount of education of new young workers, educational backgrounds for different occupations, and the relation of unemployment to amount of education.

Reviews of Data on Research and Development. January issue, "Funds for Research in Medical Schools, 1957–58." Washington, U.S. Government Printing Office, 1960. Processed, 5 p. 10 cents. (National Science Foundation, NSF 60–10.)

Reviews of Data on Research and Development. February issue, "Research and Development Expenditures of Selected Groups of Nonprofit Institutions, 1957." Washington, U.S. Government Printing Office, 1960. Processed, 4 p. 5 cents. (National Science Foundation, NSF 60–7.)

Scholarships in the Space Age (reprinted from the *Occupational Outlook Quarterly*). Washington, Bureau of Labor Statistics, U.S. Department of Labor, 1958. Processed, 7 p.

Contains information on scholarships and other financial aids to college students, with general discussion of types of scholarships, restrictions, prerequisites for and length of awards, and practical suggestions for students, parents, and teachers.

What's Ahead for College Graduates, by Helen Wood (a reprint from the *Occupational Outlook Quarterly*). Washington, Bureau of Labor Statistics, U.S. Department of Labor, 1959. Processed, 4 p.

Discussion of findings of studies of the employment trends in the professions and other occupations and of the number of college graduates and their patterns of employment, recently compiled by the Bureau of Labor Statistics.

Nongovernment Publications

Obtain direct from the publisher. Prices are indicated when known

Federal Agencies Financing Research. 1346 Connecticut Avenue, NW., Washington 6, D.C., Social Legislation Information Service, Inc., 1959. Processed, 21 p. $1.

Document designed to guide an investigator to the Federal bureau or agency that may best utilize his special competences. Index lists scientific fields and indicates agencies sponsoring extramural research in each field. Federal offices are listed alphabetically and the programs, procedures, and organization of each are summarized to indicate generally the design of each research program and the extent of its extramural component.

U.S. GOVERNMENT PRINTING OFFICE: 1960